

SPECIFICATION

MOUNTING APPARATUS FOR DATA STORAGE DEVICES

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

[0001] The present invention relates to a mounting apparatus for use, in particular, in readily securing one or more data storage device units or similar units in position on a support structure such as the chassis of a computer.

2. PRIOR ART

[0002] A popular means for mounting a data storage device in a computer chassis involves a pair of rails that is attached to side walls of the data storage device. The data storage device with the rails secured thereto is slid into the chassis from a front of the chassis, and fastened in place.

[0003] This type of rail is shown in Fig. 7. The rail comprises a body 2, a fastener 5 and an operation portion 6 extending integrally from the body 2. When pressure is applied to the operation portion 6 of the rail, the rail deforms so that the fastener 5 of the body 2 is fastened in or released from an opening (not shown) of the computer chassis. A similar example can be found in US Pat. No. 6,088,098.

[0004] When mounting or dismounting the data storage device to or from the chassis, an operator must exert sufficient pressure in directions perpendicular to the rails in order to engage or disengage the fasteners 5 in or from the openings of the chassis. However, with the trend toward downsizing of computers, the operating space inside and around a modern computer chassis can be very limited. When the space is very limited, it can be difficult or even impracticable to apply sufficient pressure on the operation portions 6. In this situation, the data storage device may not be able to be mounted in chassis, or may be mounted only after

considerable trouble and delay.

[0005] Thus, a mounting apparatus for data storage devices which overcomes the above-mentioned problems is desired.

SUMMARY OF THE INVENTION

[0006] Accordingly, an object of the present invention is to provide a mounting apparatus for readily mounting one or more data storage devices in a computer chassis, in particular, in a small sized computer chassis.

[0007] Another object of the present invention is to provide a mounting apparatus for readily removing one or more data storage devices from a computer chassis, in particular, in a small sized computer chassis.

[0008] To achieve the above-mentioned objects, a mounting apparatus of the present invention for mounting a data storage device includes a drive bracket for receiving the data storage device therein, and at least a slide rail attached to the data storage device. The bracket comprises two side walls, at least one of the side walls being provided with at least one supporting plate thereon and defining at least one first opening thereof. The slide rail rests on the supporting plate, comprises a main body and a handle demountably attached to the main body. The main body has a resilient arm, a fastening section and a stopper. The handle defines a second opening for engaging with the fastening section and stopper of the main body to attach the handle to the main body.

[0009] In assembly, the slide rail is attached to the data storage device to form a data storage device unit. The fastening section and the stopper are designed so that they can extend from the second opening of the handle, for further engaging in the first opening of the drive bracket, the data storage device unit is thus attached to the drive bracket. In disassembly, the handle is pulled forward so that it depresses the fastening section and the fastening section is disengaged from the at

least one first opening of the drive bracket, whereby the data storage device can be removed from the drive bracket.

[0010] Other objects, advantages and novel features of the present invention will be drawn from the following detailed description of a preferred embodiment of the present invention with the attached drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Fig. 1 is an exploded, isometric view of a mounting apparatus of the present invention, together with a data storage device, the mounting apparatus comprising a drive bracket, a pair of slide rails and a pair of grounding strips;

[0012] Fig. 2 an enlarged, exploded, isometric view of one of the slide rails and a corresponding one of the grounding strips of the mounting apparatus of Fig. 1;

[0013] Fig. 3 is similar to Fig. 2, but viewed from another aspect;

[0014] Fig. 4 is an assembled view of the data storage device, the slide rails and the grounding strips of Fig. 1;

[0015] Fig. 5 is an assembled view of Fig. 1, with part of the drive bracket cut away;

[0016] Fig. 6 is an enlarged view of a circled portion VI of Fig. 5; and

[0017] Fig. 7 is an isometric view of a slide rail of a conventional mounting apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] Referring to Fig. 1, a mounting apparatus of the present invention is for mounting a data storage device 20 in a drive bracket 10. The mounting apparatus comprises the drive bracket 10, a pair of grounding strips 30, and a pair of slide rails 40 wherein the slide rail 40 and the corresponding grounding strip 30 may be

deemed as one combination.

[0019] The drive bracket 10 comprises a bottom wall 12, and a pair of upstanding side walls 14. The side walls 14 comprise two pairs of supporting plates 16 extending inwardly therefrom. Each supporting plate 16 in each pair of supporting plates 16 extends toward the other supporting plate 16. The side walls 14 each define a pair of first openings 18 near a front edge thereof, the first openings 18 corresponding to the supporting plates 16.

[0020] The data storage device 20 defines a plurality of fixing apertures 21 is opposite lateral sides thereof.

[0021] Referring to Figs. 2 and 3, each grounding strip 30 is elongate. The grounding strip 30 comprises a central section 32, a pair of fixing sections 34 at opposite ends of the central section 32 respectively, and a pair of slant sections 36 interconnecting the central section 32 with the fixing sections 34 respectively. The fixing sections 34 are coplanar with each other, and offset from but parallel to the central section 32. The central section 32 comprises a pair of spaced first arcuate tongues 33A, and a second arcuate tongue 33B between the first arcuate tongues 33A. The first arcuate tongues 33A project from the central section 32 in a first direction, and the second arcuate tongue 33B projects from the central section 32 in a second direction opposite to the first direction. The fixing sections 34 each define a first fixing hole 35 therein.

[0022] Each slide rail 40 comprises a body 50, an engaging portion 60 extending from an end of the body 50, and a handle 70 demountably attached to the engaging portion 60. The body 50 comprises a main plate section 52, and a rib section 54 formed around a periphery of the plate section 52. The plate section 52 defines a pair of spaced rectangular slots 56 for receiving the first arch tongues 33A of a corresponding grounding strip 30, and a pair of second fixing holes 57 corresponding to the first fixing holes 35 of the grounding strip 30. A

pair of slanted catches 58 is formed near opposite ends of the plate section 52 respectively, for abutting against the slant sections 36 of the grounding strip 30.

[0023] The handle 70 comprises a main plate 72, and a pair of flanges 74 extending from opposite top and bottom edges of the main plate 72 respectively. Each side plate 74 has an undulated outer surface, for facilitating convenient manual operation during assembly and disassembly. A railing 76 further extends vertically inwardly from a distal end of each flanges 74. The main plate 72, flanges 74 and railings 76 cooperatively define a receiving space therebetween, for receiving the engaging portion 60. The main plate 72 defines a second opening 73.

[0024] The engaging portion 60 comprises a resilient arm 61, a wedge-shaped fastening/latching section 62 formed on a free end of the arm 61, and a stopper 64 protruding from an outside of the engaging portion 60 and being spaced a small distance from the fastening section 62. The fastening section 62 is shaped so that it can engage in the second opening 73 of the handle 70 and further engage in a corresponding first opening 18 of the drive bracket 10.

[0025] In pre-assembly, the handle 70 of each slide rail 40 is slid over the engaging portion 60. The fastening section 62 is snappingly engaged in the second opening 73 of the handle 70, with the stopper 64 abutting an edge of the main plate 72 at a front of the opening 73. Each slide rail 40 is thus assembled.

[0026] Referring to Fig. 4, in assembly, each grounding strip 30 is attached to a corresponding slide rail 40. The first arcuate tongues 33A of the grounding strip 30 are received in the slots 56 of the slide rail 40. The first fixing holes 35 of the grounding strip 30 are aligned with the second fixing holes 57 of the slide rail 40. The combined grounding strip 30 and slide rail 40 is attached to a corresponding lateral side of the data storage device 20, with the first fixing holes 35 being aligned with the corresponding fixing apertures 21 of the data storage device 20.

A pair of fasteners such as screws 90 is extended through the second fixing holes 57 of the slide rail 40 and the first fixing holes 35 of the grounding strip 30, and engaged in the fixing apertures 21 of the data storage device 20. The second arcuate tongue 33B resiliently presses on the lateral side of the data storage device 20. In this way, the slide rails 40 and corresponding grounding strips 30 are firmly attached to the opposite lateral sides of data storage device 20, thereby forming a data storage device unit.

[0027] Referring Figs. 5 and 6, the rib sections 54 of the slide rails 40 are placed on a selected pair of the supporting plates 16 of the drive bracket 10. Then the data storage device unit is slid into the drive bracket 10 until the fastening sections 62 are snappingly engaged in the corresponding first openings 18 of the drive bracket 10, with the stoppers 64 abutting against frontmost portions of the corresponding side walls 14 of the drive bracket 10. The slide rails 40 are thereby prevented from sliding too far into the drive bracket 10. At this position, the first arcuate tongues 33A resiliently press on the side walls 14. The data storage device unit is thus securely attached to the drive bracket 10, with the data storage device 20 grounded to the drive bracket 10.

[0028] In disassembly, the handles 70 are pulled forward. Edges of the main plates 72 at rears of the openings 73 of the handles 70 ride along the fastening sections 62. The fastening sections 62 are thereby resiliently pressed inwardly, and are released from the first openings 18 of the drive bracket 10. The data storage device unit is then easily removed from the drive bracket 10.

[0029] In order to disengage the fastening sections 62 from the first openings 18 of the drive bracket 10, an operator applies pressures in directions parallel to the slide rails 40. Compare this with prior art apparatuses, in which pressures are applied in directions perpendicular to slide rails. Thus the mounting apparatus of the present invention is very convenient to use in application environments that have limited working space, such as with small-scale computer chassis.

[0030] It is understood that the invention may be embodied in other forms without departing from the spirit thereof. Thus, the present example and embodiment is to be considered in all respects as illustrative and not restrictive, and the invention is not to be limited to the details given herein.